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ABSTRACT OF THE DISCLOSURE

The present invention is directed to an improved electroplating method, chemistry, and production worthy apparatus for depositing noble metals (e.g., platinum) and their alloys onto the surface of the workpiece, such as a semiconductor wafer, pursuant to manufacturing a microelectronic device, circuit, and/or component. The reliability of the noble metal material deposited using the disclosed method, chemistry, and/or apparatus is significantly better than the reliability of noble metal structures deposited using the teachings of the prior art. This is largely attributable to the low stress of films that are deposited using the teachings disclosed herein. The metals, which can be deposited, include gold, silver, platinum, palladium, ruthenium, iridium, rhodium, osmium and alloys containing these metals.